

### Abstract

System and method for performing Time Domain Reflectometry (TDR) on a Device Under Test (DUT) using Gaussian pulses. A signal is received comprising an  
5 initial Gaussian pulse and one or more reflected pulses from the DUT. Each pulse is characterized by determining a set of estimated parameters, permuting the estimated parameter set to generate one or more permuted parameter sets, generating linear equations from the parameter sets, including parameter variables for the corresponding Gaussian pulse, and determining values for the parameter variables by solving the linear  
10 equations. The determined parameters characterize the Gaussian pulse. If there are N parameters to determine and M permutations generated, where M is greater than or equal to N, M+1 linear equations are solved to overdetermine the N parameters. The determined parameters of the initial pulse and the one or more reflected pulses are useable to perform TDR analysis on the DUT.